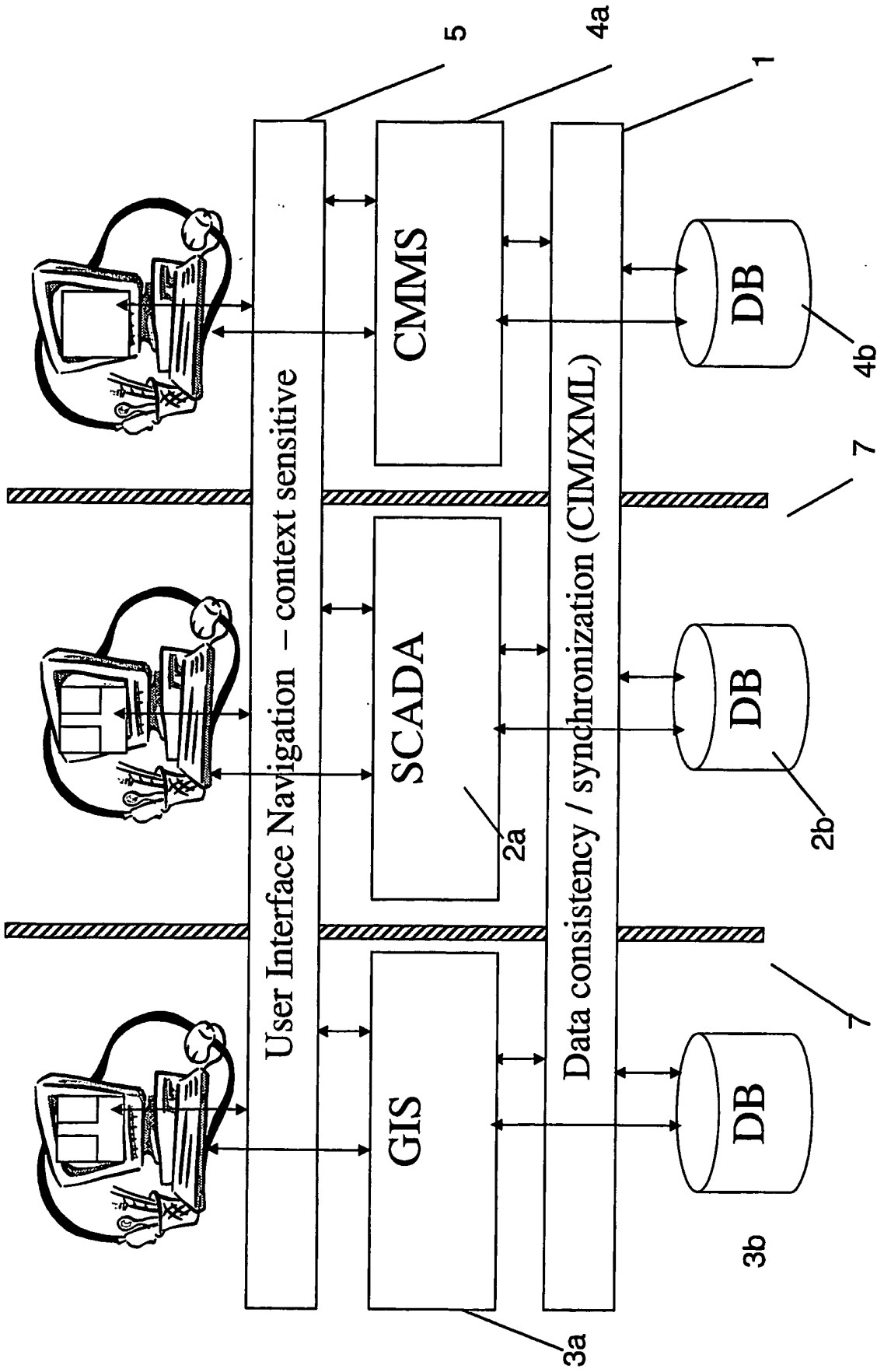


Figure 1

BEST AVAILABLE COPY

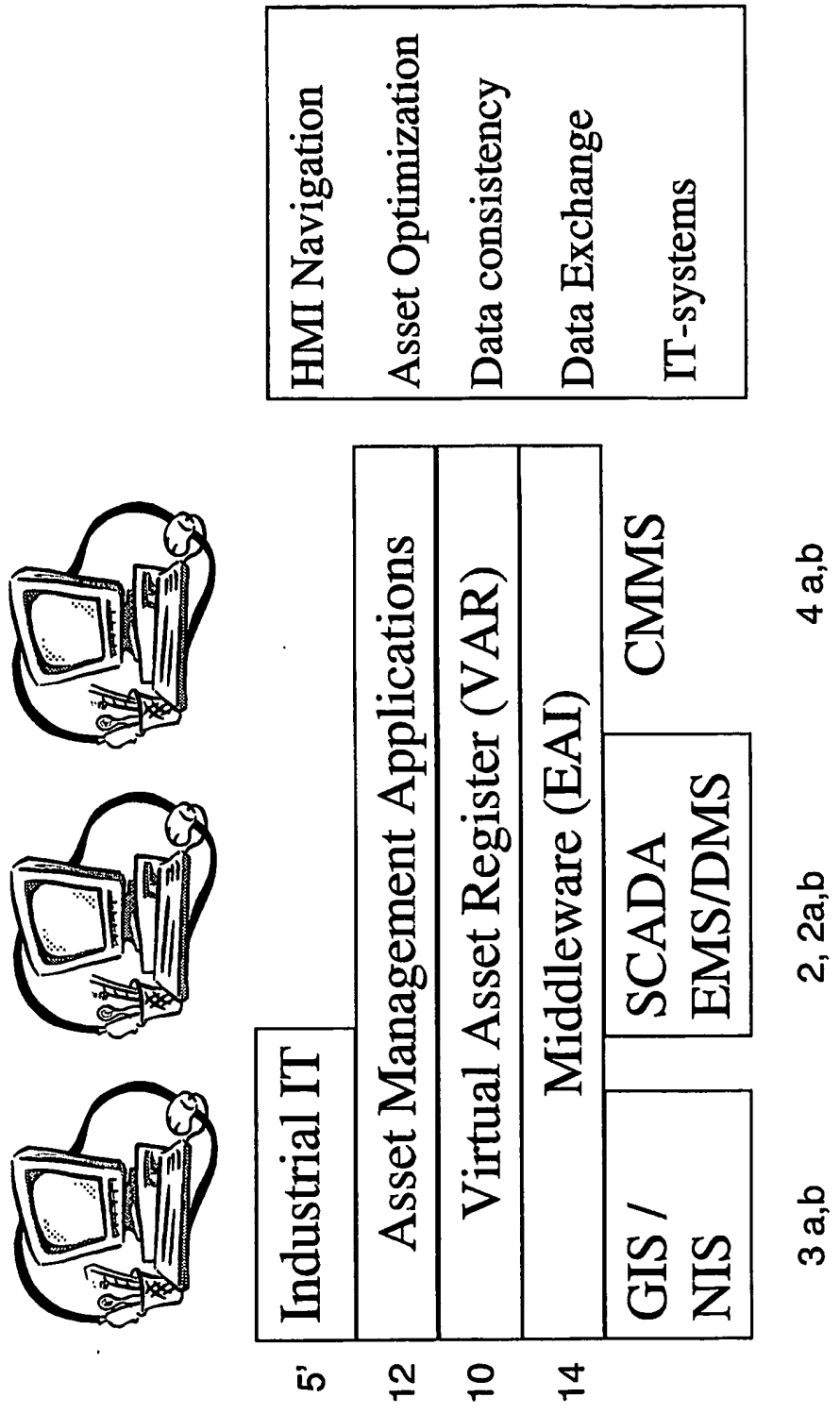
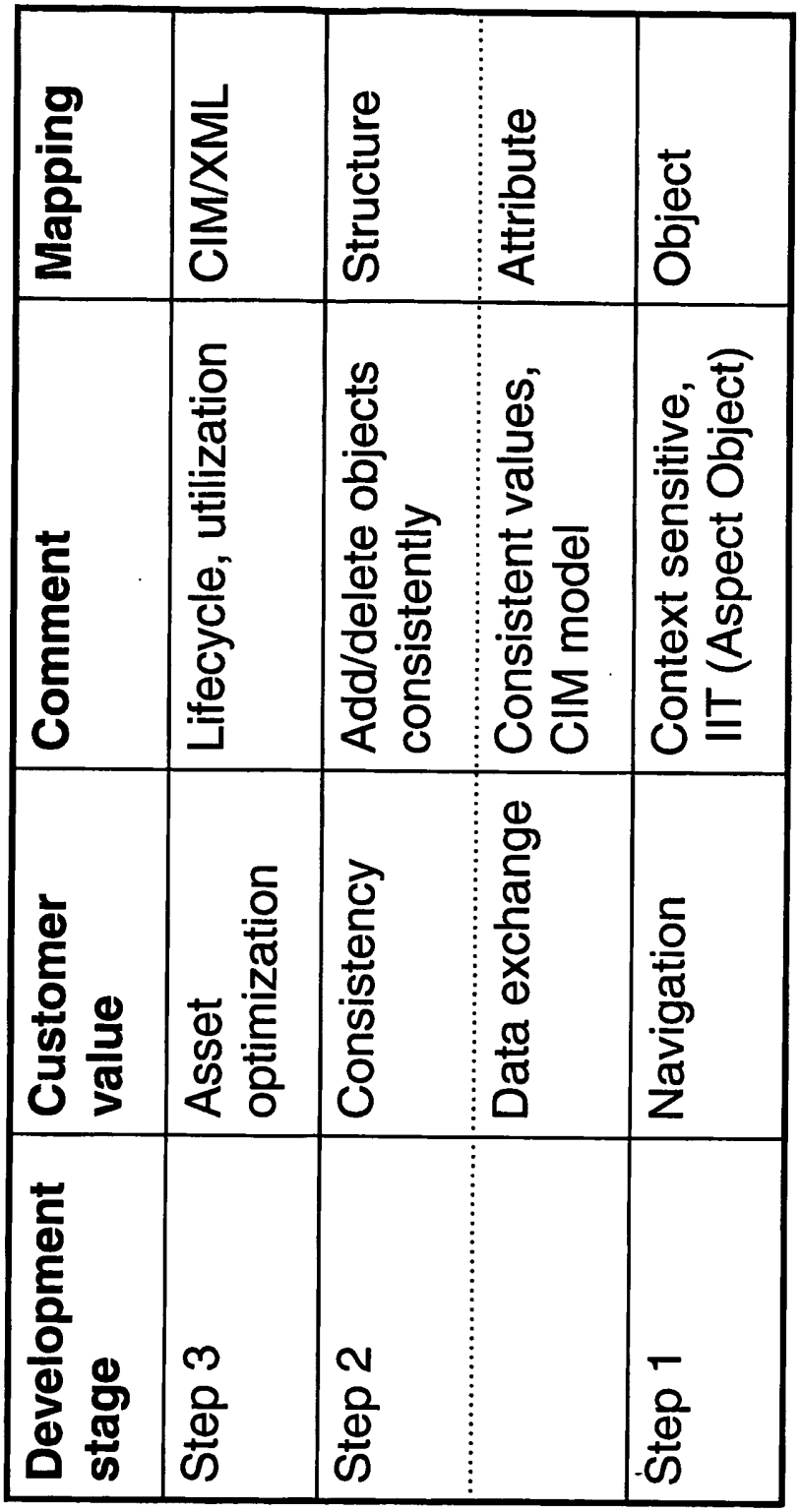

HMI Navigation
Asset Optimization
Data consistency
Data Exchange
IT-systems
Industrial IT
Asset Management Applications
Virtual Asset Register (VAR)
Middleware (EAI)
GIS / NIS
SCADA EMS/DMS
CMMS
5'
12
10
14
3 a,b
2, 2a,b
4 a,b

Figure 2



Development stage	Customer value	Comment	Mapping
Step 3	Asset optimization	Lifecycle, utilization	CIM/XML
Step 2	Consistency	Add/delete objects consistently	Structure
	Data exchange	Consistent values, CIM model	Attribute
Step 1	Navigation	Context sensitive, IIT (Aspect Object)	Object

Figure 3

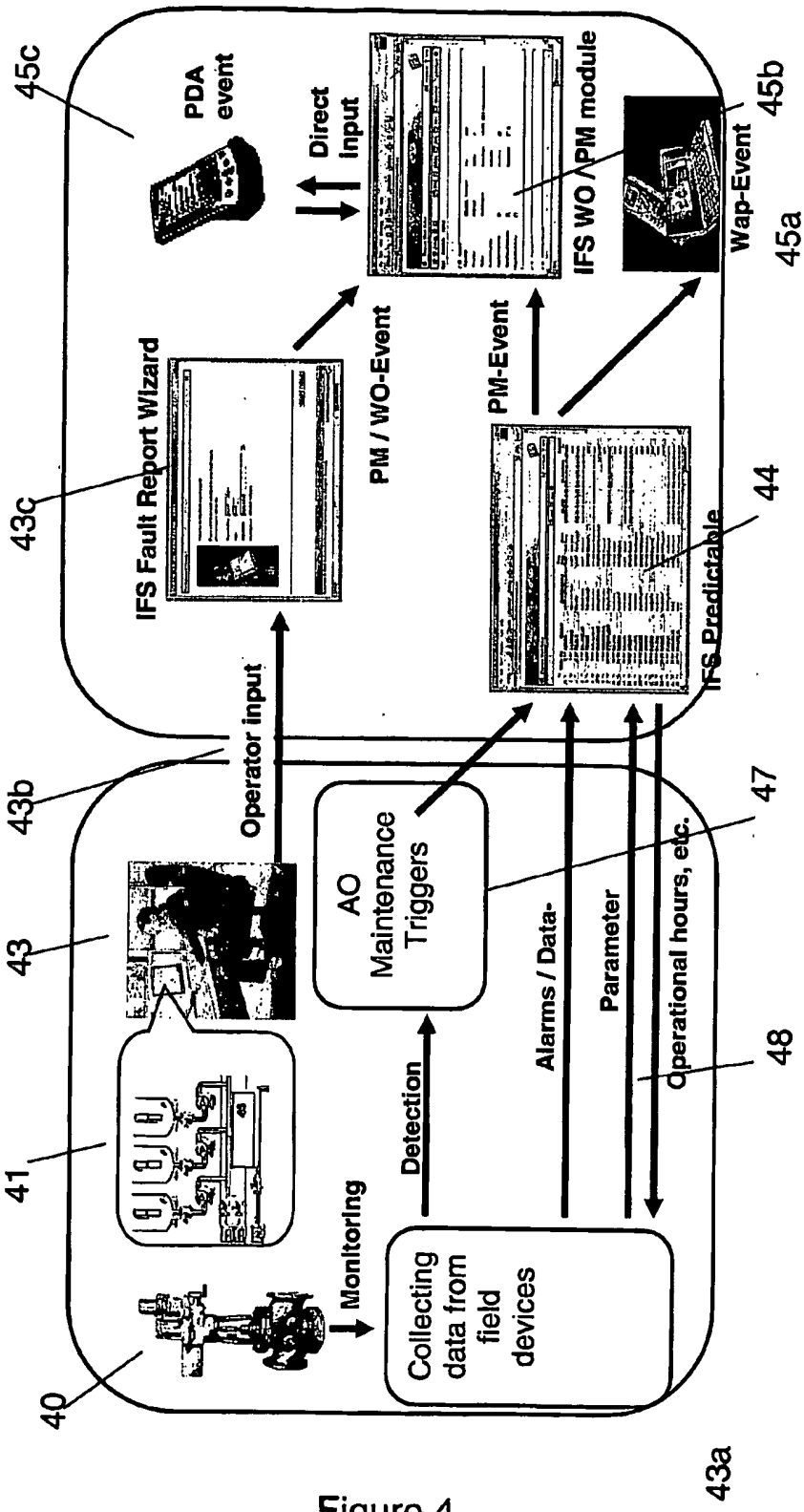
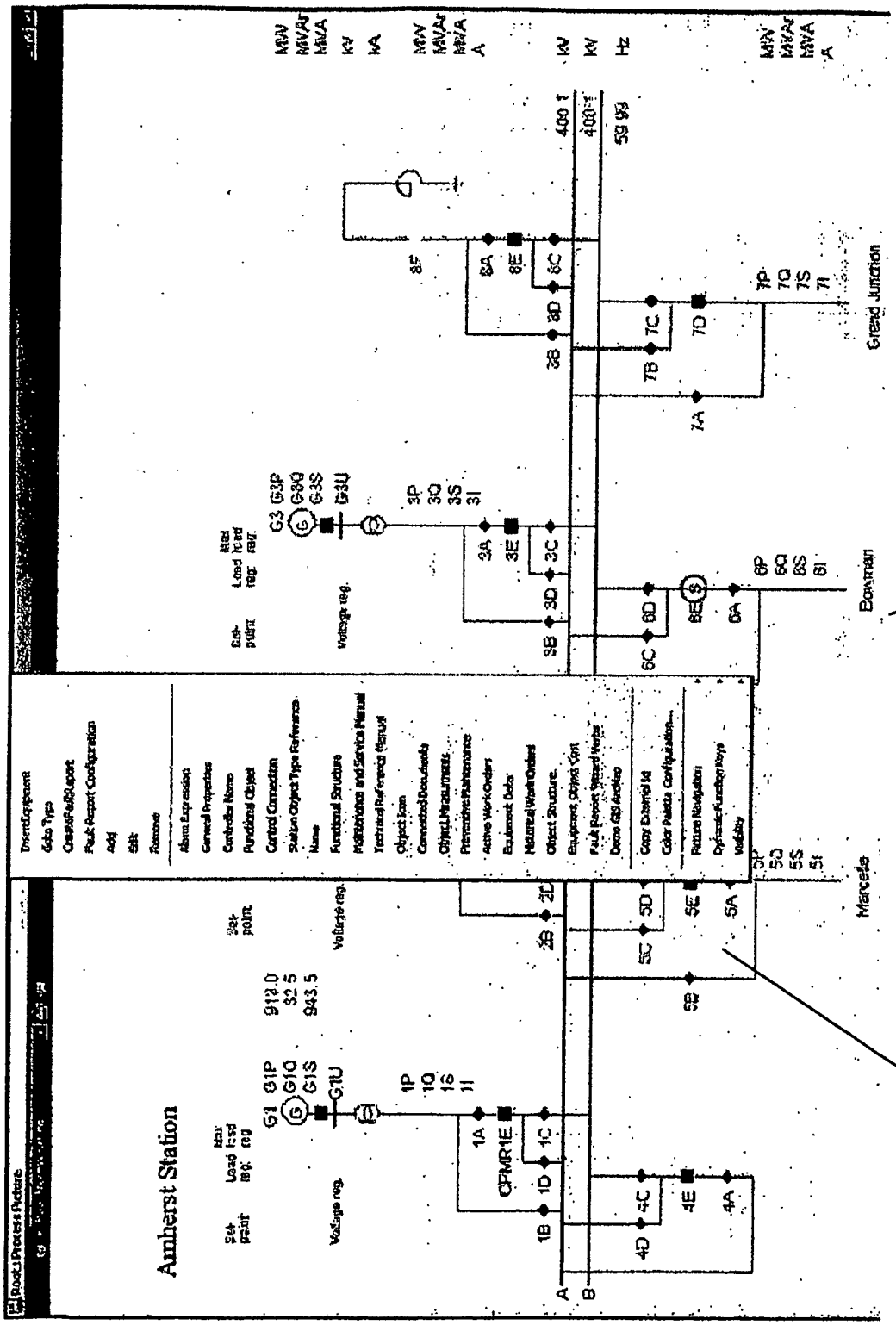

45c
PDA event
Direct Input
IFS WO / PM module
Wap-Event
45b
45a
IFS Fault Report Wizard
PM / WO-Event
PM-Event
43c
44
IFS Predictable
Operator input
43b
47
AO Maintenance Triggers
43
Alarms / Data-
Parameter
Operational hours, etc.
48
41
Detection
Monitoring
Collecting data from field devices
40
43a

Figure 4


Amherst Station
Grand Junction
Bowman
Marcella
50
51

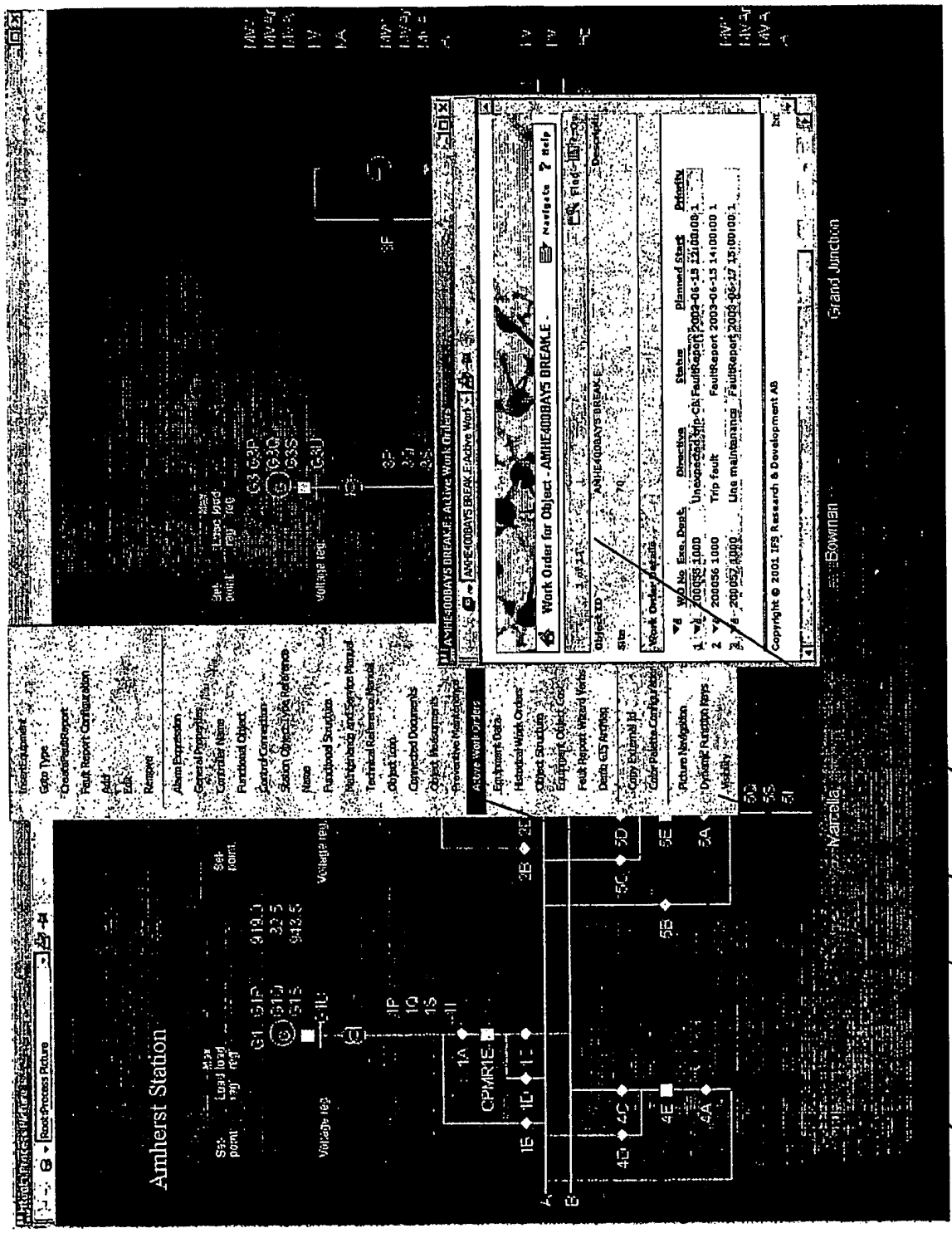

Amherst Station
Work Order for Object - AMHE400BAYS BREAK.E
Grand Junction
Bowman
Marcella
50
51
52
53

Figure 6

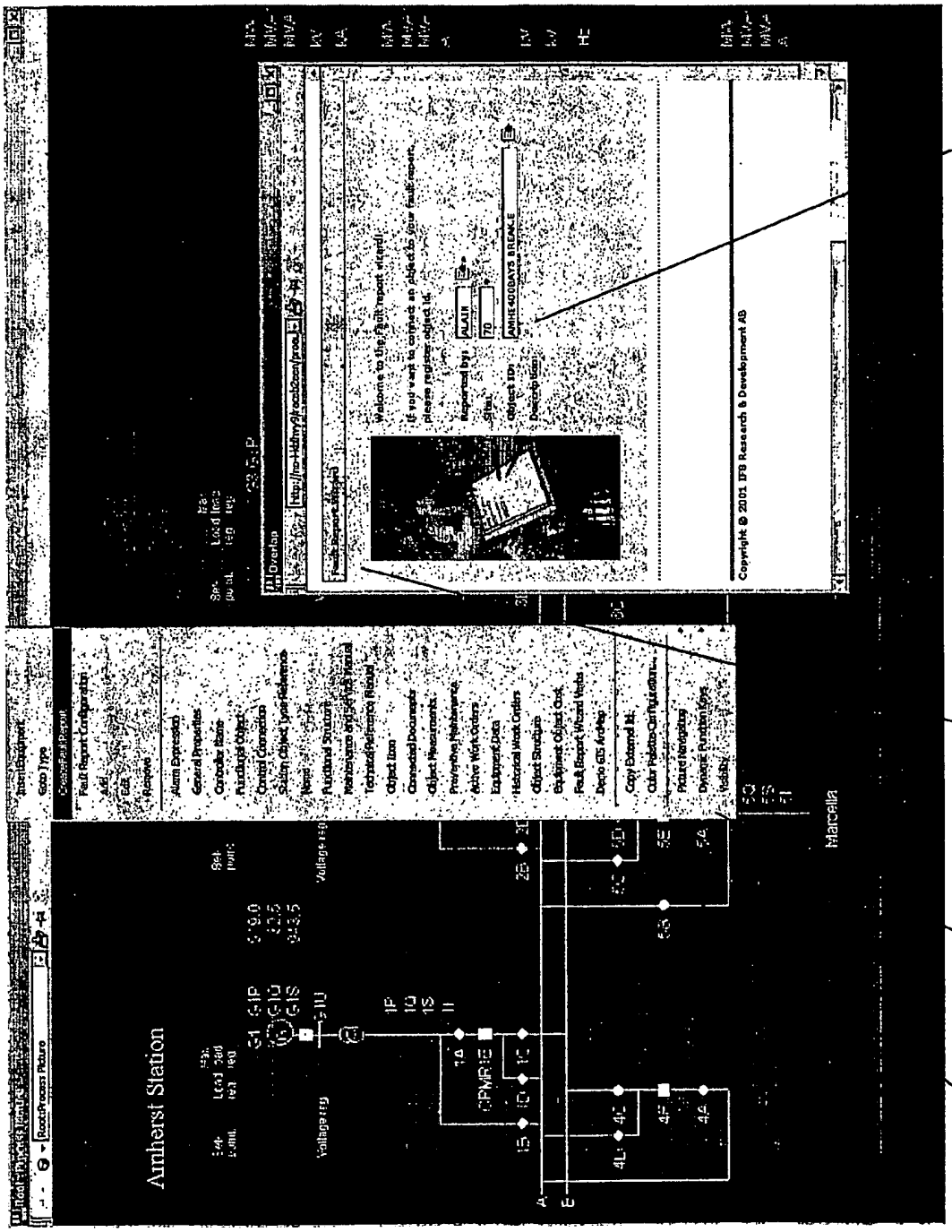

Amherst Station
Marcella
Copyright © 2001 IFB Research & Development AB
50
51
55
57

Figure 7

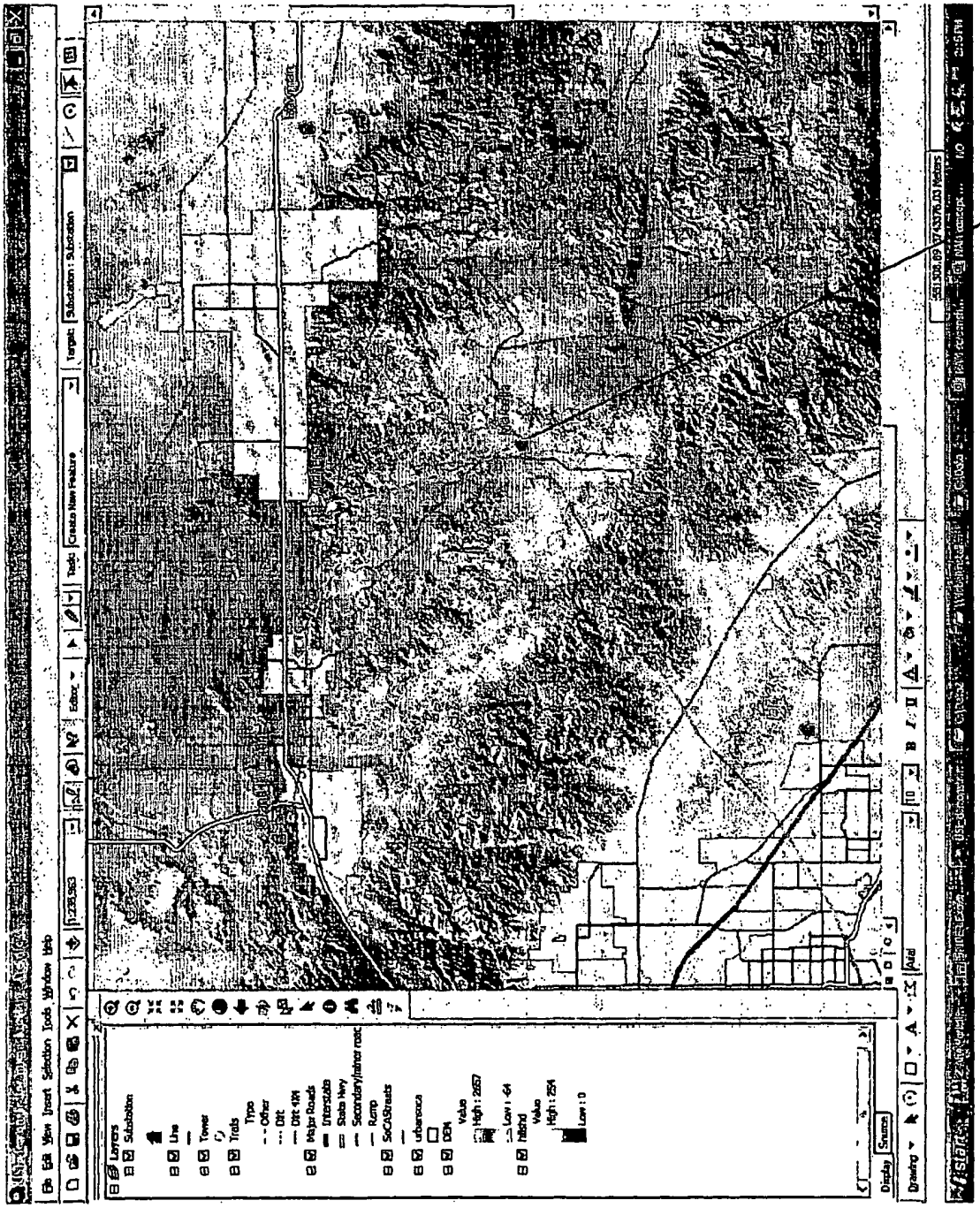


Figure 8

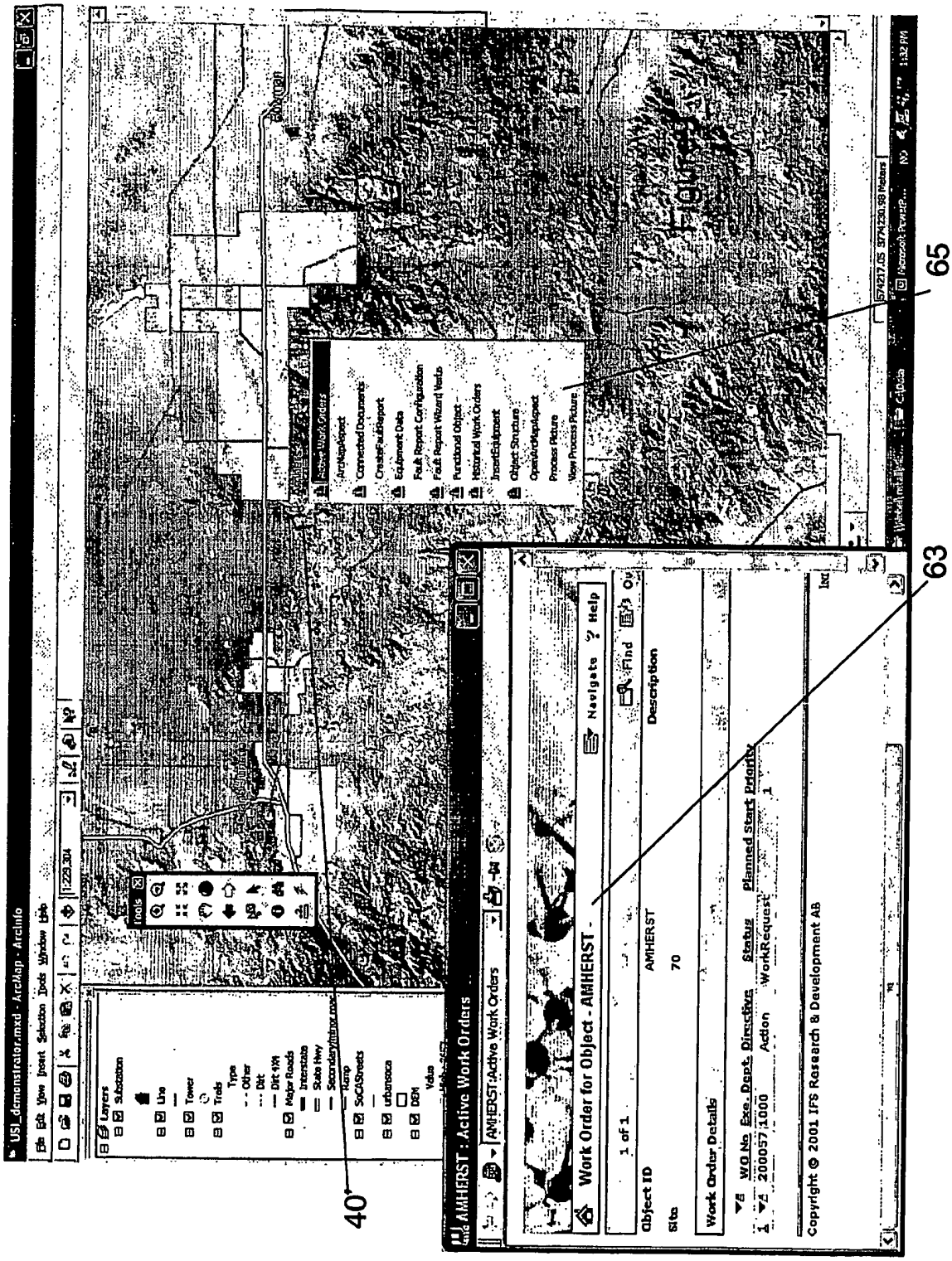


Figure 9

SUBSTITUTE SHEET (RULE 26)

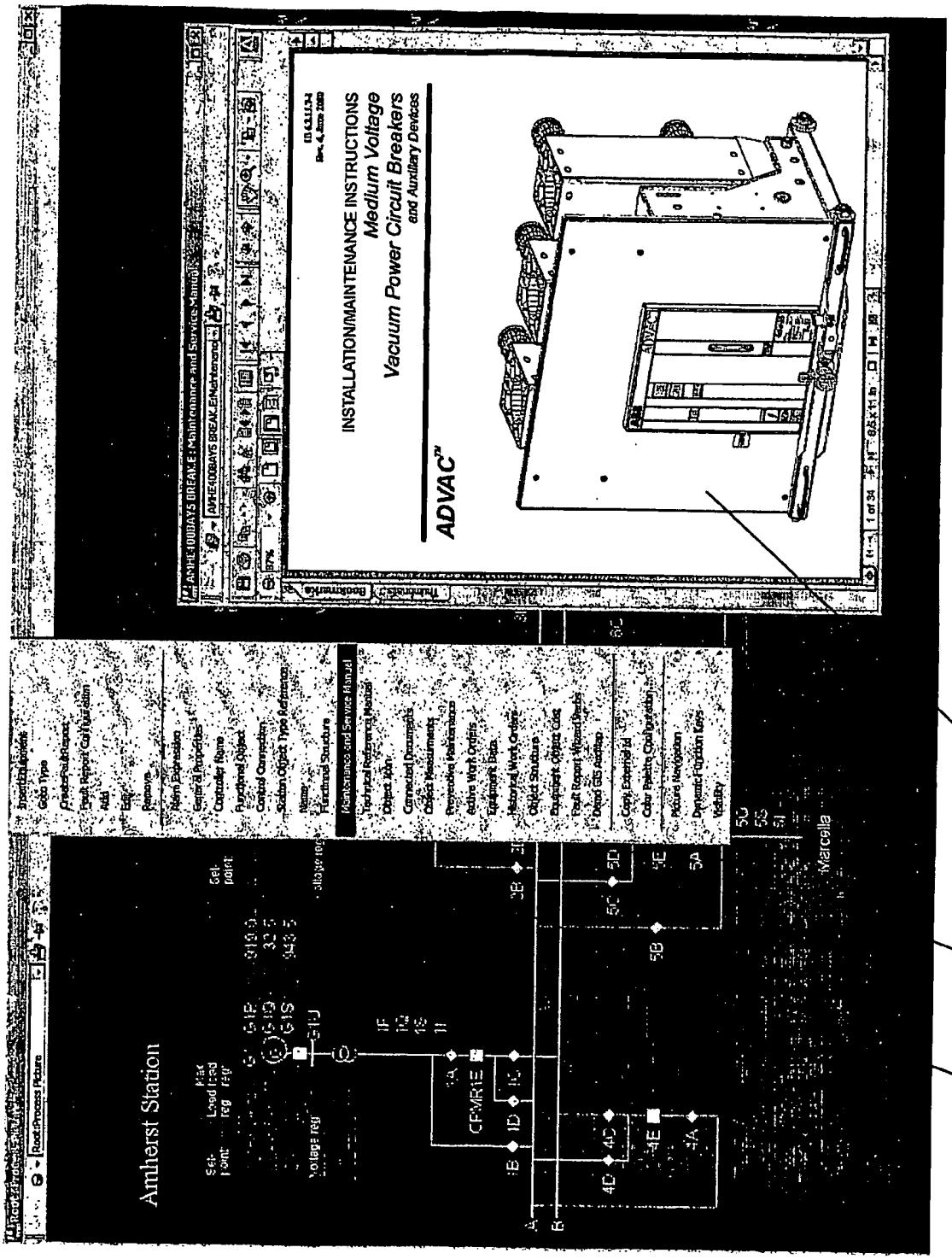

INSTALLATION/MAINTENANCE INSTRUCTIONS
Medium Voltage
Vacuum Power Circuit Breakers
and Auxiliary Devices
ADVAC
Amherst Station
100
51
59
50

Figure 10

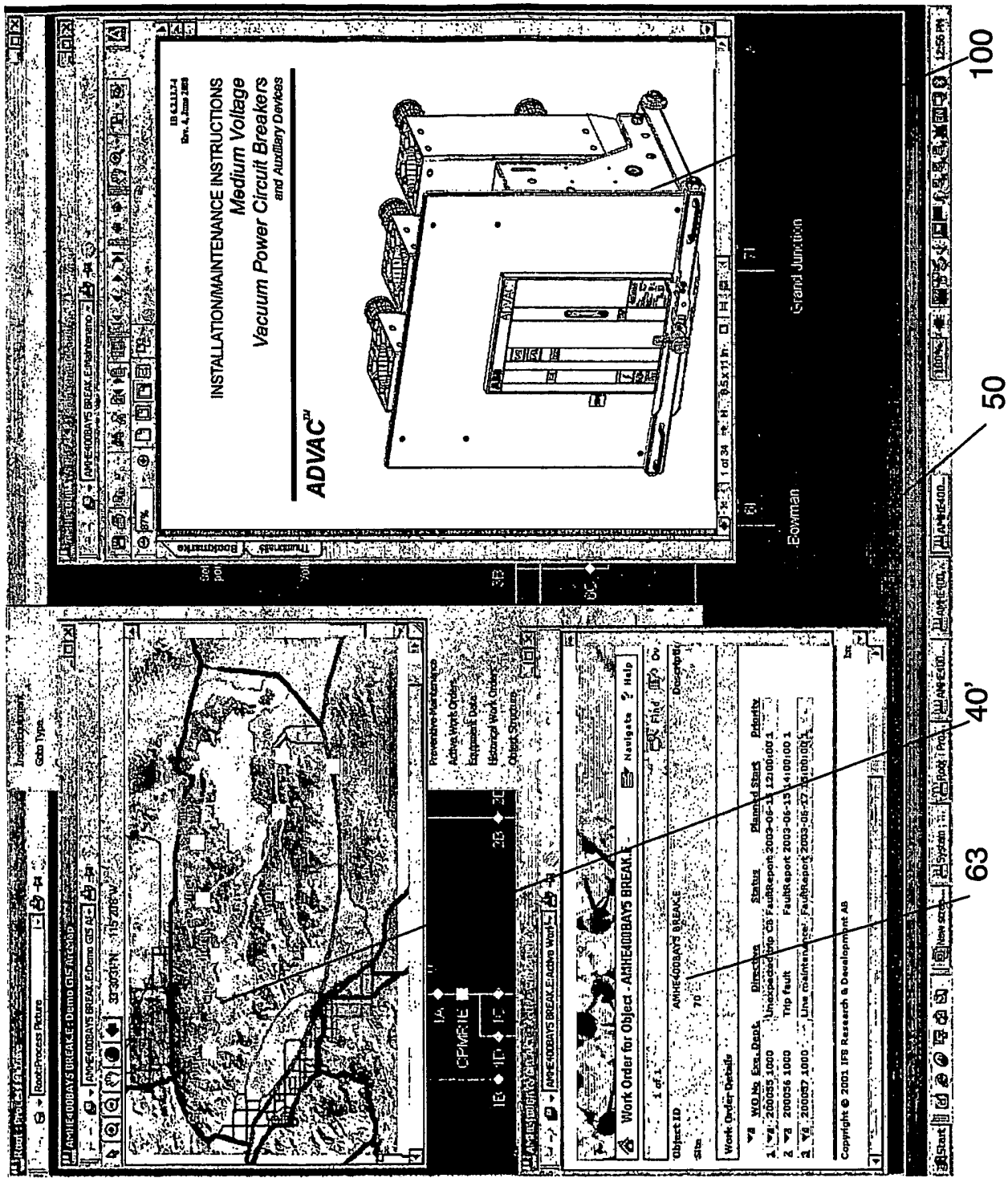

INSTALLATION/MAINTENANCE INSTRUCTIONS
Medium Voltage
Vacuum Power Circuit Breakers
and Auxiliary Devices
ADVAC
Work Order for Object - AMHE400BAYS BREAK
100
50
40'
63

Figure 11

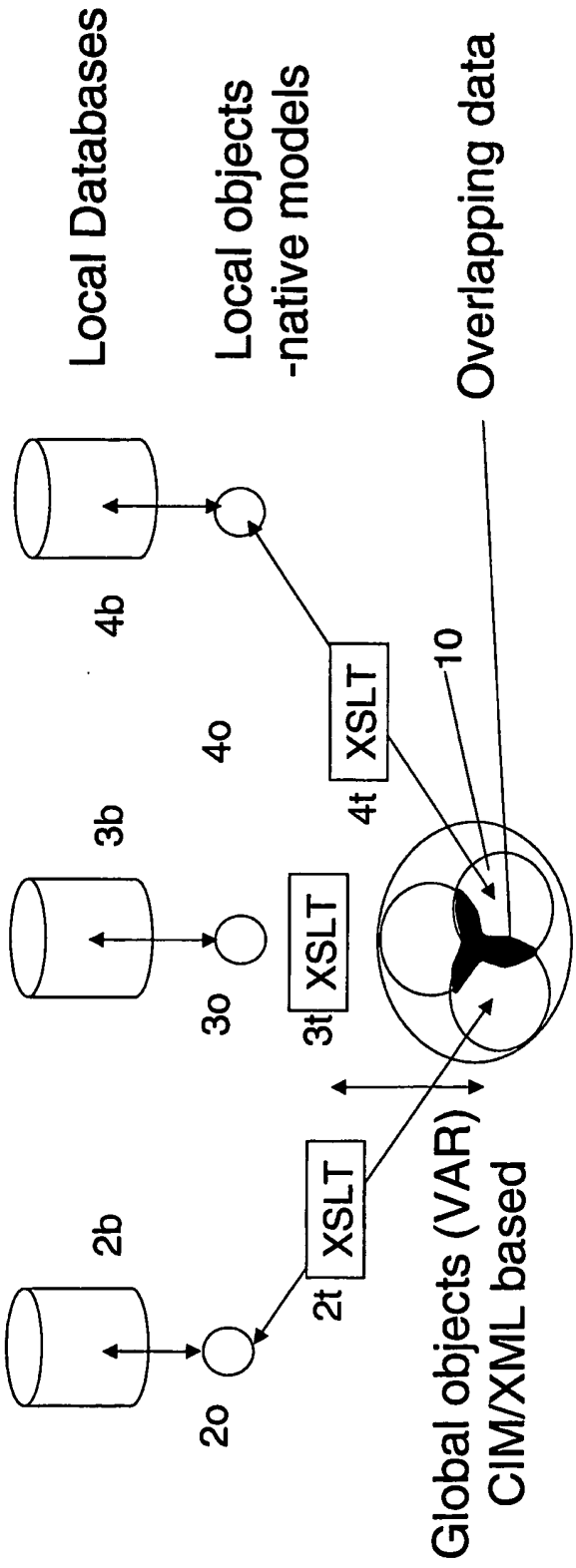

Local Databases
Local objects
-native models
Overlapping data
4b
4o
4t
XSLT
10
3b
3o
3t
XSLT
2b
2o
2t
XSLT
Global objects (VAR)
CIM/XML based

Figure 12

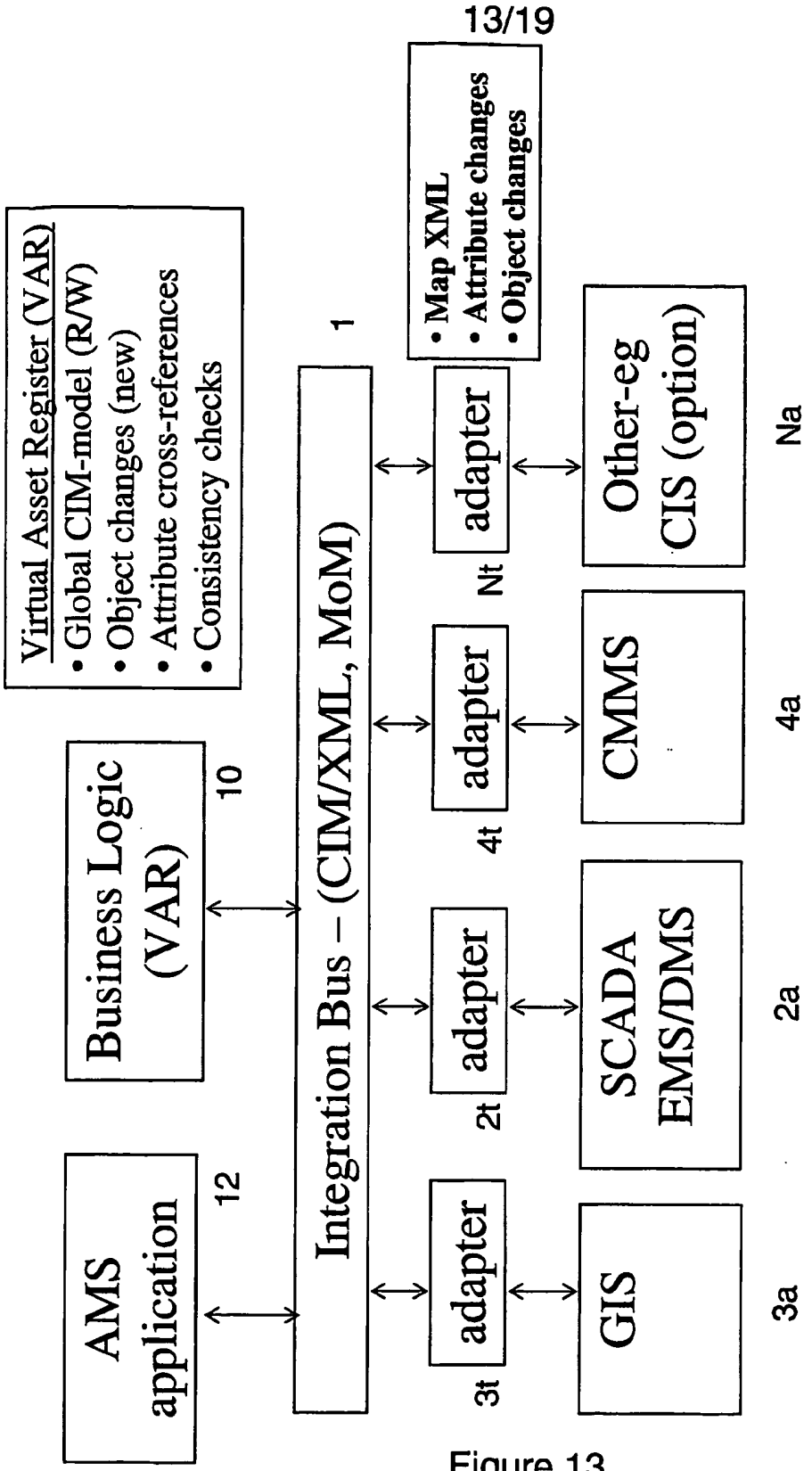

Virtual Asset Register (VAR)
• Global CIM-model (R/W)
• Object changes (new)
• Attribute cross-references
• Consistency checks
Business Logic (VAR)
10
AMS application
12
Integration Bus – (CIM/XML, MoM)
1
• Map XML
• Attribute changes
• Object changes
adapter
3t
adapter
2t
adapter
4t
adapter
Nt
GIS
SCADA EMS/DMS
CMMS
Other-eg CIS (option)
3a
2a
4a
Na

Figure 13

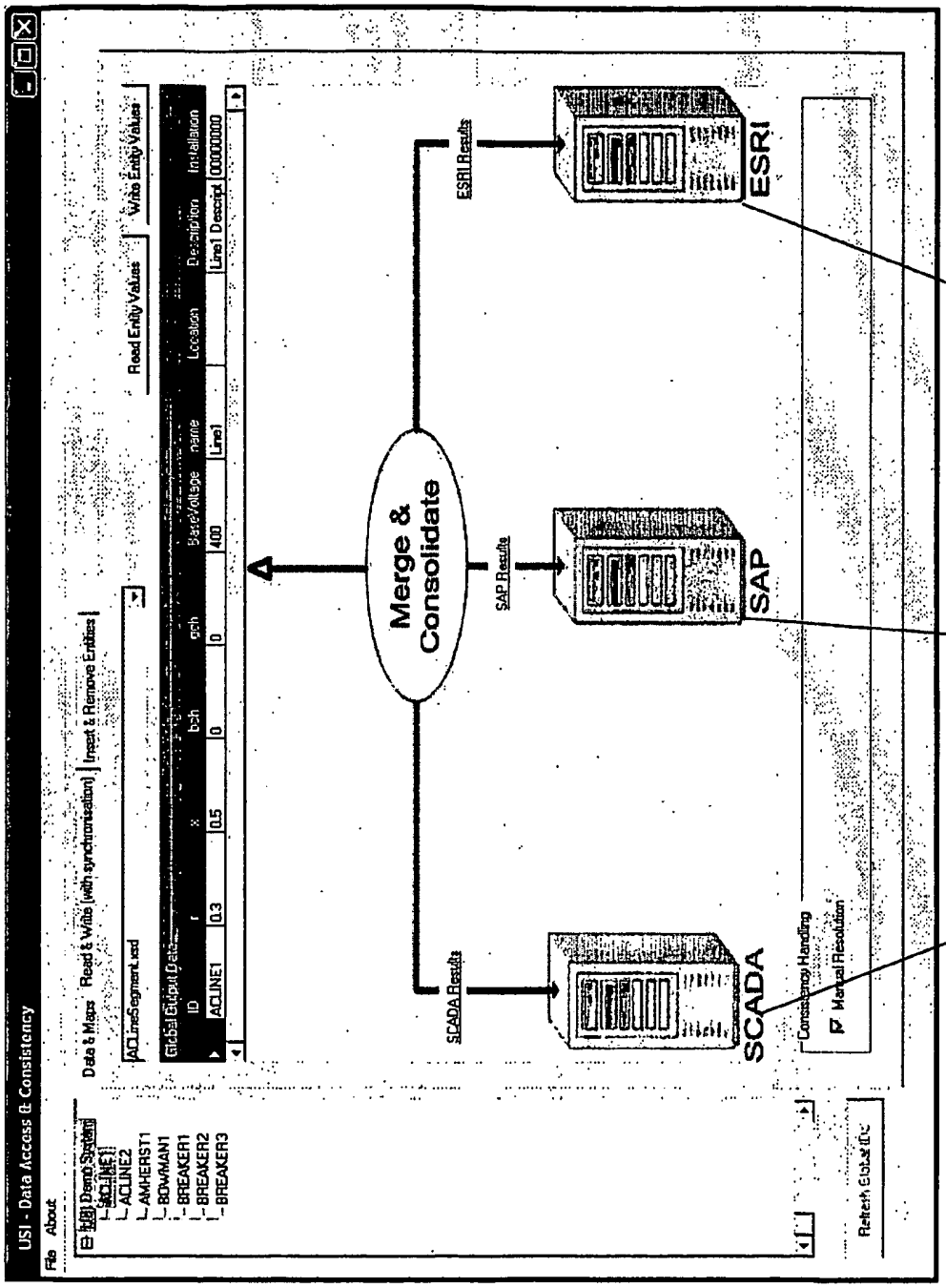

USI - Data Access & Consistency
File About
Data & Maps
Read & Write (with synchronisation)
Insert & Remove Entities
Read Entity Values
Write Entity Values
Merge & Consolidate
SCADA Results
SAP Results
ESRI Results
SCADA
SAP
ESRI
Consistency Handling
Manual Resolution
Refresh Global IDs
114
2, 2a, b
4, 4a,b
3a, b

Figure 14

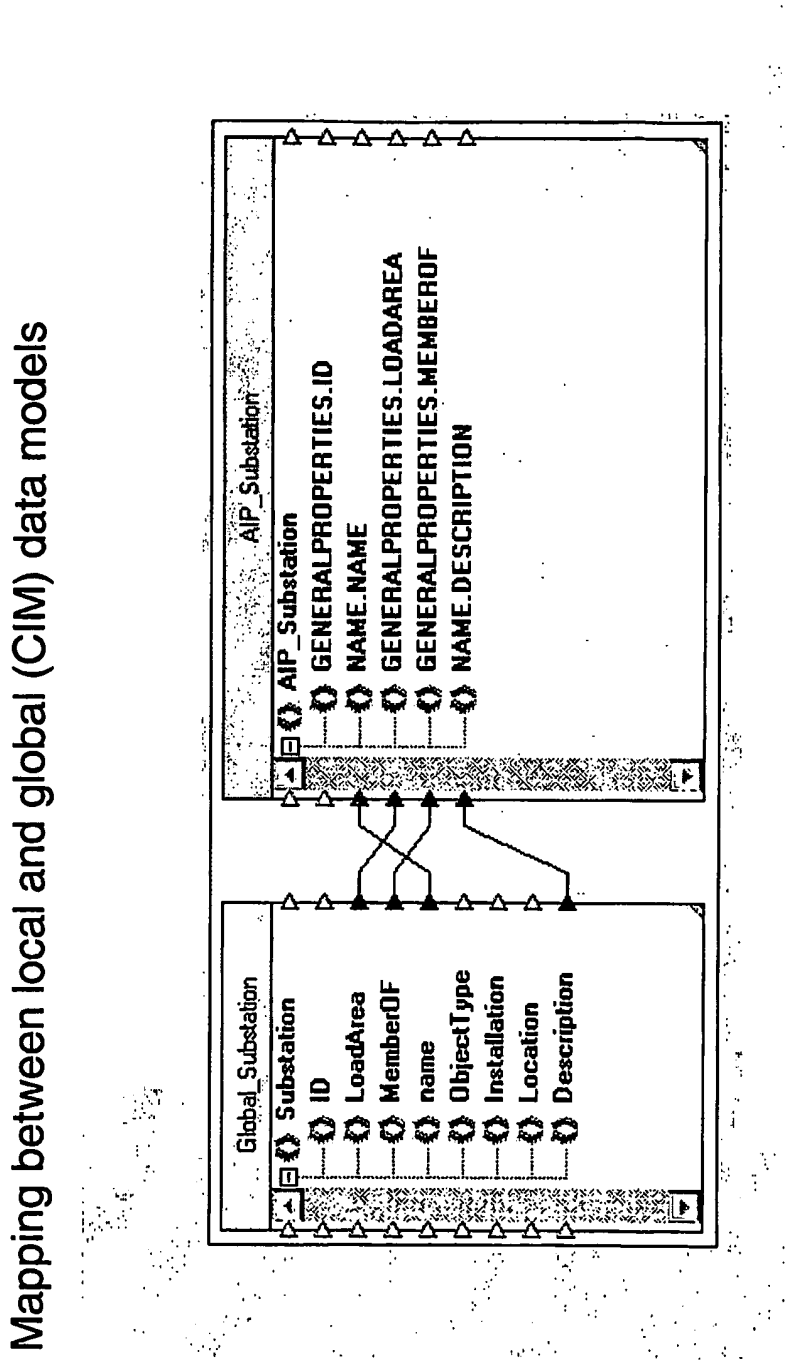

Mapping between local and global (CIM) data models
Global_Substation
Substation
ID
LoadArea
MemberOF
name
ObjectType
Installation
Location
Description
AIP_Substation
AIP_Substation
GENERALPROPERTIES.ID
NAME.NAME
GENERALPROPERTIES.LOADAREA
GENERALPROPERTIES.MEMBEROF
NAME.DESCRIPTION

Figure 15

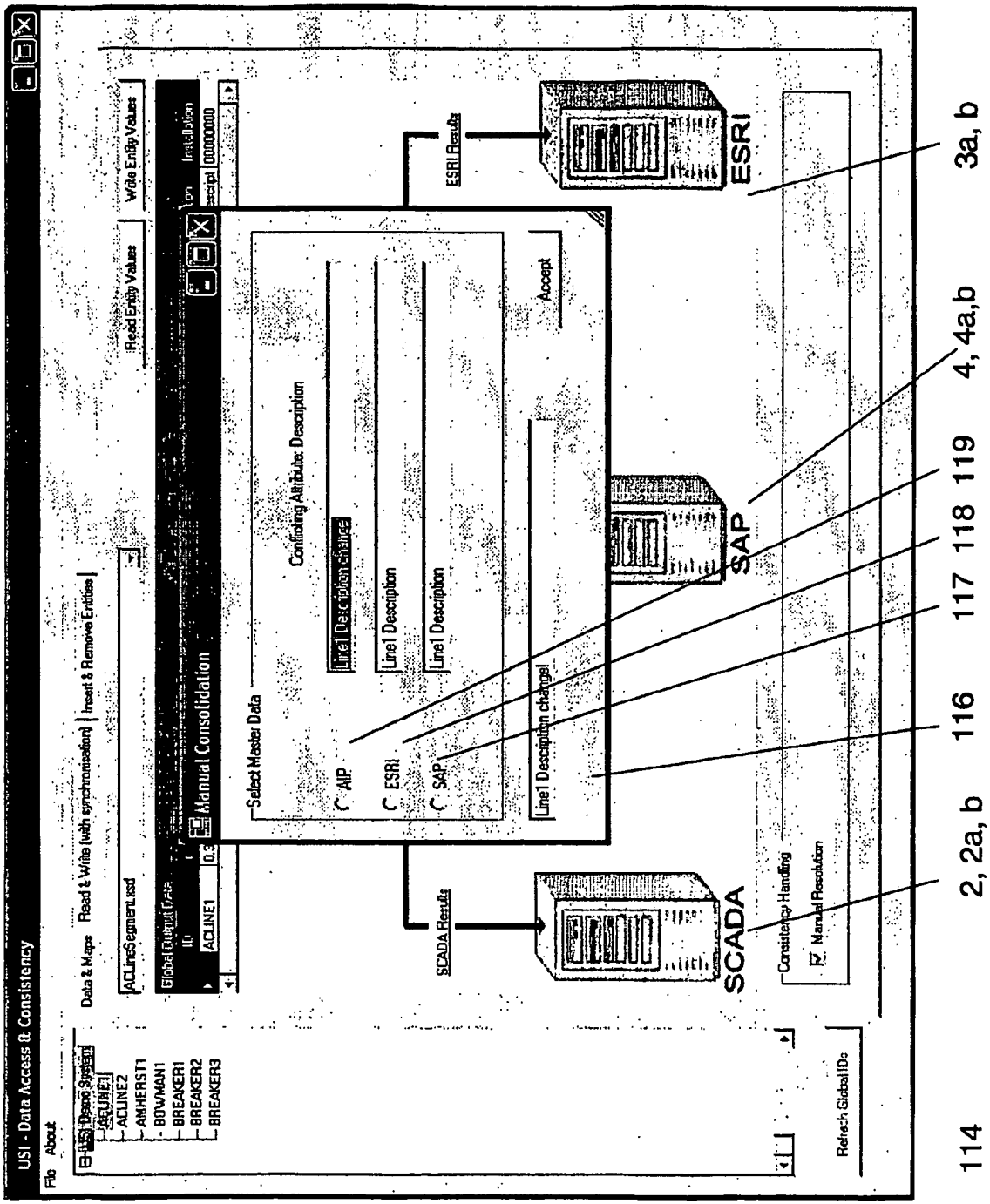

USI - Data Access & Consistency
File About
Data & Maps
Read & Write (with synchronization)
Insert & Remove Entities
ACLineSegment.ssd
Read Entity Values
Write Entity Values
Manual Consolidation
Select Master Data
Controlling Attribute: Description
AIP
ESRI
SAP
Line1 Description change
Line1 Description
Line1 Description
Line1 Description changed
Accept
ESRI Results
SCADA Results
ESRI
SAP
SCADA
Consistency Handling
Manual Resolution
Refresh Global IDs
ACLINE1
ACLINE2
AMHERST1
BOWMAN1
BREAKER1
BREAKER2
BREAKER3
114
2, 2a, b
116
117
118
119
4, 4a,b
3a, b

Figure 16

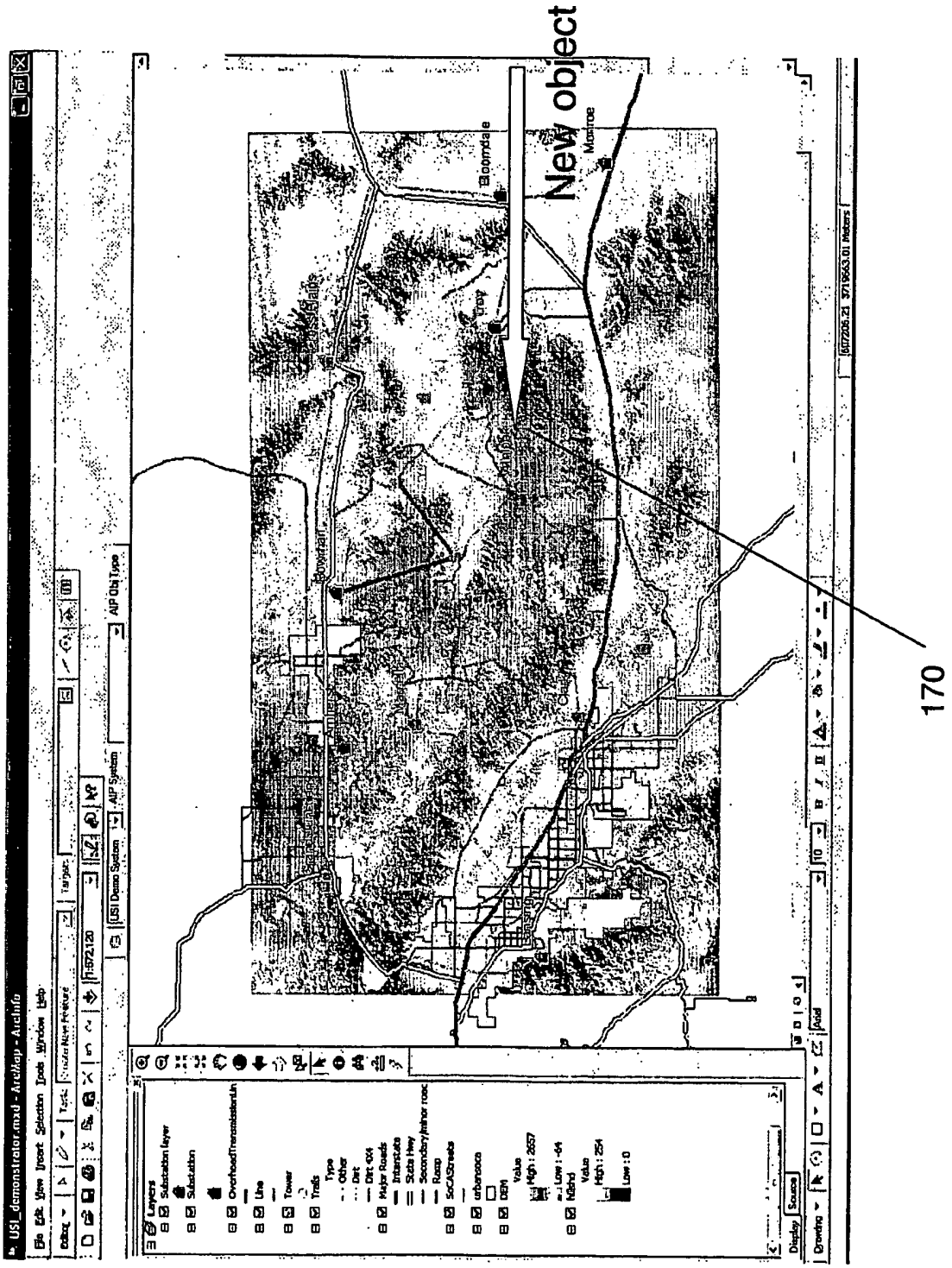


Figure 17

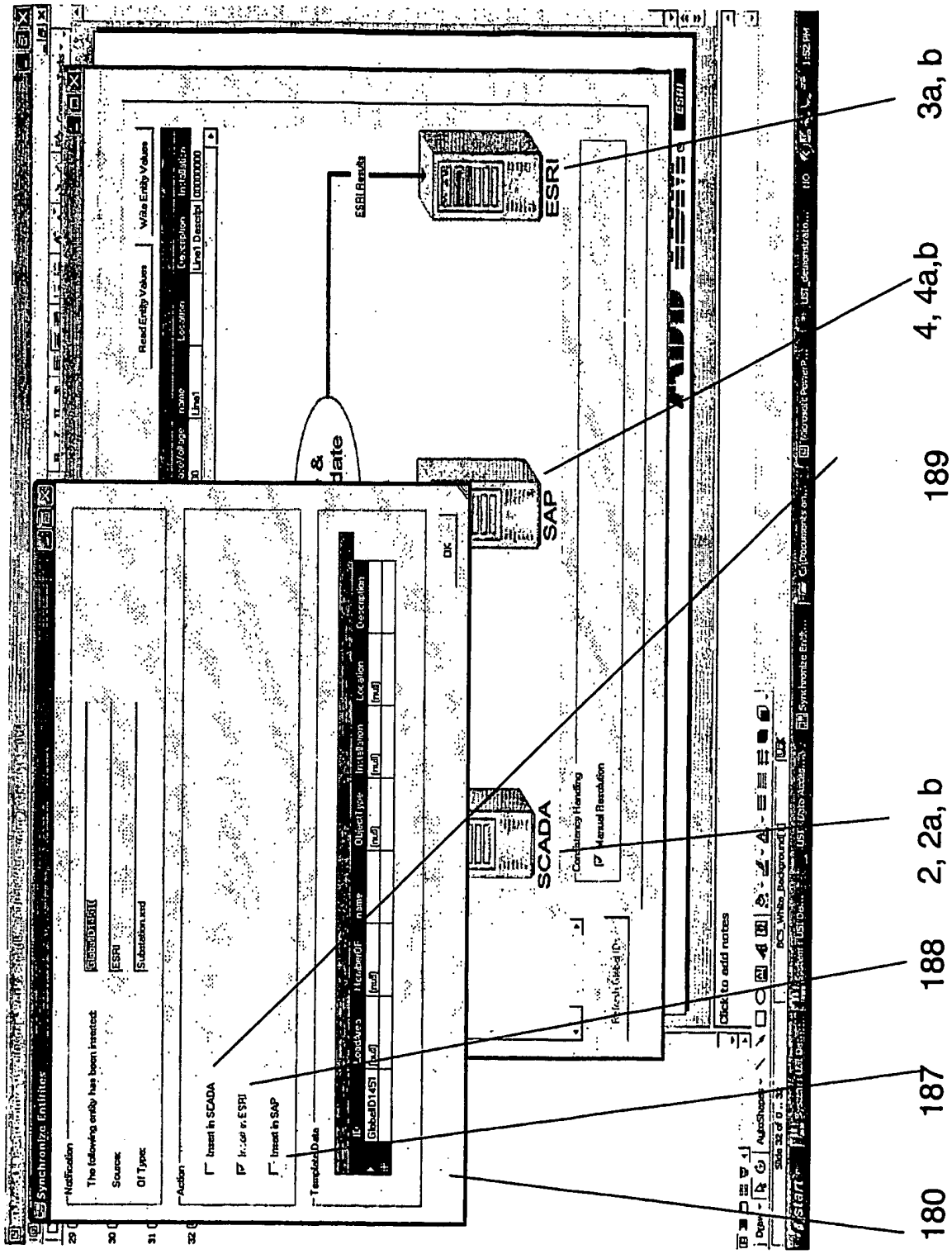

3a, b
4, 4a,b
189
2, 2a, b
188
187
180
ESRI
SAP
SCADA
Synchronize Entities
Insert in SCADA
Insert in SAP
Manual Resolution
Click to add notes

Figure 18

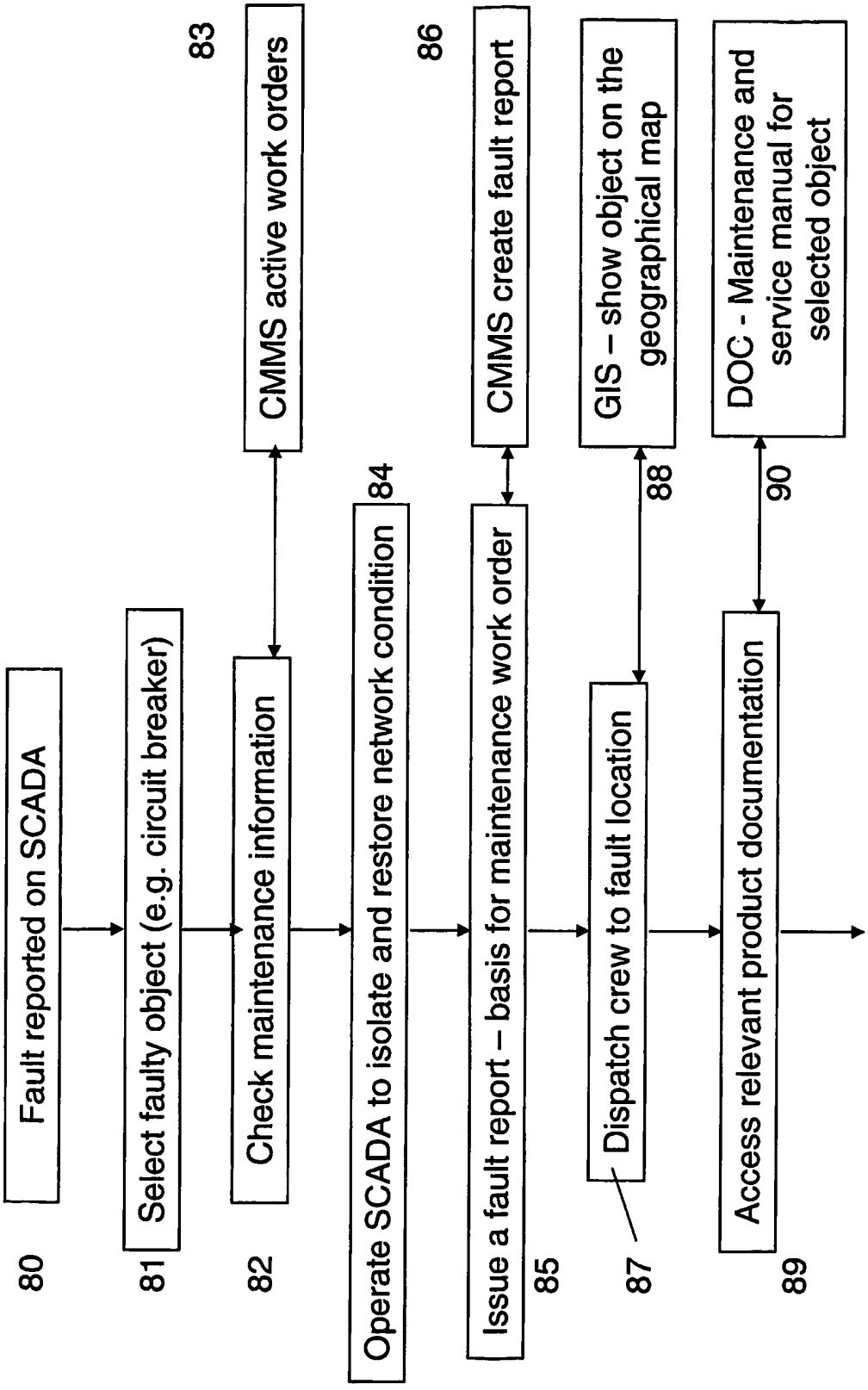

Fault reported on SCADA
80
Select faulty object (e.g. circuit breaker)
81
Check maintenance information
82
CMMS active work orders
83
Operate SCADA to isolate and restore network condition
84
CMMS create fault report
86
Issue a fault report – basis for maintenance work order
85
Dispatch crew to fault location
87
GIS – show object on the geographical map
88
Access relevant product documentation
89
DOC - Maintenance and service manual for selected object
90

Figure 19

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